

What is claimed:

- 1) A process for forming a pattern of porous and reduced porosity areas on a porous structure comprising the steps of: selecting one or more layers of a porous structure, forming a pattern template having a solid matrix containing one or more openings, said one or more openings being arranged in the solid matrix to form the selected pattern for the areas of porous and reduced porosity, contacting the template to a selected surface of the porous structure and applying an energy selected from the group consisting of heat, pressure, softening and combinations thereof to the areas of the structure aligned with the solid matrix in the template in order to cause the porous structure beneath the solid matrix of the template to collapse and become fused into a reduced porosity mass.
- 2) A patterned porous structure comprising one or more layers of a porous structure having one or more areas of porous material and one or more areas of reduced porosity or non-porous material.
- 3) The patterned structure of claim 2 wherein the one or more areas of porous material are more than one in number and are arranged in a manner so as to be separate and distinct from each other and separated from each other by a reduced porosity or non-porous structure.
- 4) The patterned structure of claim 2 wherein the one or more areas of porous material are of a shape selected from the group consisting of circles, ovals, polygons, lines, and mixtures thereof.
- 5) The patterned structure of claim 2 wherein the one or more porous areas are 96 in number and are equal in size.
- 6) The patterned structure of claim 2 wherein the one or more areas are at least 96 in number, equal in size and arranged in rows relative to each other in both the X and Y direction.
- 7) The patterned structure of claim 2 wherein the one or more areas are at least 384 in number.
- 8) A process for forming a pattern of porous and reduced porosity or non-porous areas on a porous structure comprising the steps of: selecting a porous structure, forming a pattern template containing the selected pattern for the areas of porous and reduced

porosity or non-porous areas, said template having a series of openings which corresponding to the porous areas, contacting the template to a surface of the porous structure and applying a energy selected from the group consisting of heat, pressure, softening agents and combinations thereof to the areas of the structure not aligned with the openings in the template in order to cause the porous structure beneath the area of the template not aligned with the openings of the template to collapse and to become fused into a reduced porosity or non-porous mass.

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- 9) The patterned structure of claim 2 wherein the porous structure is formed of two or more layers.
- 10) The patterned structure of claim 2 wherein the porous structure is formed of two or more layers and each of the layers have one or more areas of porous material and one or more areas of reduced porosity material formed therein.
- 11) The patterned structure of claim 2 wherein the porous structure is formed of two or more layers and each of the layers have one or more areas of porous material and one or more areas of reduced porosity material formed therein and wherein the reduced porosity areas are non-porous.
- 12) The patterned structure of claim 2 wherein the porous structure is formed of two or more layers and less than all of the layers have one or more areas of porous material and one or more areas of reduced porosity material formed therein and in register with each other.
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- 13) The patterned structure of claim 2 wherein the porous structure is formed of two or more layers and each of the layers have one or more areas of porous material and one or more areas of reduced porosity material formed therein and the areas of porous and reduced porosity material vary from layer to layer.
- 14) The patterned structure of claim 2 wherein the porous structure is formed of two or more layers and at least one of the one or more layers have one or more areas of porous material and one or more areas of reduced porosity material formed therein.
- 15) The patterned structure of claim 2 wherein the porous structure is formed of two or more layers, at least one of the layers has one or more areas of porous material and one or more areas of reduced porosity material formed therein and wherein the two or more layers are selected from the group consisting of porous membranes, porous support materials and blends thereof.

- 16) The patterned structure of claim 2 wherein the porous structure is formed of two or more layers, at least one of the layers has one or more areas of porous material and one or more areas of reduced porosity material formed therein and wherein at least one layer is a porous membrane and the remaining layer(s) are selected from the group consisting of porous membranes, porous support materials, reduced porosity or non-porous materials and blends thereof.
- 17) The patterned structure of claim 2 wherein the porous structure is formed of two or more layers and each of the layers having formed therein one area of porous material surrounded by one area of reduced porosity material along an outer periphery of the porous material.
- 18) The patterned structure of claim 2 wherein the porous structure is formed of two or more layers, each of the layers having formed therein one area of porous material surrounded by one area of reduced porosity material along an outer periphery of the of the porous material and the porous material being in a shape selected from the group consisting of circles, ovals, triangles, rectangles, squares and polygons.
- 19) The patterned structure of claim 2 wherein the porous structure is formed of two or more layers of porous membranes and each of the layers having formed therein one area of porous material surrounded by one area of reduced porosity material along an outer periphery of the porous material and wherein the reduced porosity material is non-porous.
- 20) The patterned structure of claim 2 wherein the porous structure is formed of two or more layers of porous structures, each of the layers having formed therein one area of porous material surrounded by one area of reduced porosity material along an outer periphery of the porous material and the porous structures are formed of a materials selected from the group consisting of polyolefins, polyolefin copolymers and terpolymers, PTFE resin, thermoplastic perfluoropolymers, polyamides, polyimides, PVDF, polyethersulphones, polysulphones, polyarylsulphones, PVC, PET, polycarbonates, cellulose, cellulose esters, cellulose acetate, cellulose nitrate, polystyrenes, polyetherimides, acrylic polymers, methacrylic polymers, copolymers of acrylic or methacrylic polymers, epoxies, epoxy filled materials, polyurethanes and blends of any of the above.

- 21) The patterned structure of claim 2 wherein the porous structure is formed selected from the group consisting of polyolefins, polyolefin copolymers and terpolymers, PVDF, PTFE resin, thermoplastic perfluoropolymers, polyamides, polyimides, polyethersulphones, polysulphones, polyarylsulphones, PVC, PET, polycarbonates, cellulose, cellulose esters, cellulose acetate, cellulose nitrate, polystyrenes, polyetherimides, acrylic polymers, methacrylic polymers, copolymers of acrylic or methacrylic polymers, epoxies, epoxy filled materials, polyurethanes and blends of any of the above.
- 22) The patterned structure of claim 2 wherein the porous structure is surfaced modified before the formation of the porous and reduced porosity areas.
- 23) The patterned structure of claim 2 wherein the porous structure is surfaced modified after the formation of the porous and reduced porosity areas.
- 24) The patterned structure of claim 2 wherein the surface modification is selected from the group consisting of hydrophilic coatings, hydrophobic coatings, negatively charged coatings and positively charged coatings.